

CLAIMS

What is claimed is:

1. An AC adaptor connectable to a main body of an apparatus through a power line, comprising:
 - a rectifying and smoothing unit for rectifying and smoothing an inputted alternating current voltage;
 - a switching unit for switching the voltage rectified and smoothed by said rectifying and smoothing unit; and
 - an operating frequency supplying unit for supplying an operating frequency of switching performed by said switching unit,wherein said operating frequency supplying unit supplies a first operating frequency to said switching unit when said main body of the apparatus operates normally, and supplies a second operating frequency, which is lower than said first operating frequency, to said switching unit when the power line to said main body of the apparatus is separated, or when said main body of the apparatus is in a prescribed standby state.
2. The AC adaptor according to Claim 1 further comprising:
 - a plug for connecting said power line to said main body of the apparatus,
 - wherein said plug comprises an operating section that operates to switch the operating frequency when connected to said main body of the apparatus.

1 3. The AC adaptor according to Claim 1, wherein said power line comprises a
2 voltage line for a secondary output voltage outputted on the basis of switching
3 by said switching unit and a DC return line, as well as a control line for
4 switching the operating frequency supplied by said operating frequency
5 supplying unit.

1 4. The AC adaptor according to Claim 3, wherein the operating frequency supplied
2 by said operating frequency supplying unit is switched by short-circuiting or
3 opening said control line against said DC return line.

1 5. A power supply device for supplying electric power to the main body of the
2 apparatus by performing a prescribed switching operation, comprising:

3 a switching unit for performing a switching operation for the primary power
4 source; and

5 a control unit for controlling the switching operation performed by said
6 switching unit,

7 wherein said control unit controls said switching unit on the basis of the first
8 operating frequency, and controls said switching unit on the basis of the second
9 operating frequency, which is lower than said first operating frequency when said main
10 body is in a low power consumption mode.

1 6. The power supply device according to Claim 5, further comprising:

2 an output voltage line required for supplying electric power to said main body
3 of the apparatus and a DC return line, as well as a control line the state of which is
4 changed by whether said main body is in a low power consumption mode or not,

5 wherein said control line switches between said first operating frequency and
6 said second operating frequency on the basis of the state of said control line.

1 7. The power supply device according to Claim 6, wherein the state of said control
2 line is changed by the operation from said main body.

1 8. A power supply device of a switching regulator system for switching the voltage
2 obtained by rectifying and smoothing an alternating current voltage, and
3 supplying a DC voltage to the main body of the apparatus, comprising:
4 a switching unit for performing a switching operation on the basis of a prescribed
5 operating frequency; and
6 a control unit for controlling said switching unit so as to perform a switching
7 operation at a low operating frequency when said main body of the apparatus is in a
8 prescribed waiting mode.

1 9. A Voltage Supply apparatus comprising:
2 electrical equipment connected to an alternating current power source,
3 a DC voltage supply device for supplying a DC voltage to the main body
4 wherein said DC voltage supply device comprises:
5 a rectifying and smoothing unit for rectifying and smoothing an inputted
6 alternating current voltage;
7 a switching unit for performing switching the voltage rectified and smoothed by
8 said rectifying and smoothing unit; and
9 an operating frequency supplying unit for supplying the operating frequency of
10 switching performed by said switching unit and an operating frequency of a low
11 frequency for a standby state mode; and
12 said main body shifts said operating frequency supplying unit to said waiting
13 mode when said main body is in a prescribed standby state.

1 10. The apparatus according to Claim 9, wherein said prescribed standby
2 state includes a soft-off or suspend state of said main body of the apparatus.

1 11. An electrical device comprising:
2 an AC adaptor connected to an alternating current power source, and for
3 supplying a DC voltage;
4 a main apparatus connected to said AC adaptor through a power line, and
5 activated by an output voltage from said AC adaptor; and
6 an operating section that operates depending on the state of connection between
7 said AC adaptor and said main apparatus through said power line,

8 wherein said AC adaptor activates a switching circuit by the direct current power
9 converted from an alternating current power, converts the output from said switching
10 circuit and supplies the DC voltage to said main apparatus, and shifts the state of said
11 switching circuit to a low power mode on the basis of the operation of said operating
12 section performed corresponding to the opening of said power line.

13 12. The device according to Claim 11, wherein said AC adaptor in said
14 low power mode activates said switching circuit with an operating frequency lower
15 than a normal operating frequency.

16 13. The device according to Claim 11, wherein said operating section is
17 provided in the plug for connecting said AC adaptor to said main apparatus through
18 said power line, and is constituted so as to implement the operation performed
19 corresponding to the opening of said power line when said plug is disconnected from
20 said main apparatus.

1 14. A method for controlling a power supply device that supplies a DC voltage to
2 the main body of an apparatus by switching the voltage obtained by rectifying
3 and smoothing an alternating current voltage,
4 wherein switching is performed at a first operating frequency when said main
5 body of the apparatus is performing a normal operation, and
6 switching is performed at a second operating frequency that is lower than said
7 first operating frequency when said main body of the apparatus is in a prescribed
8 standby state.

1 15. The method for controlling a power supply device according to Claim 14,
2 wherein said prescribed standby state is that the main body of the apparatus is
3 in a soft-off or suspend state.

1 16. The method for controlling a power supply device according to Claim 14,
2 wherein a prescribed controlled state is produced on the basis of the state of
3 connection of the line between said power supply device and said main body of the
4 apparatus, and
5 switching is performed by said first operating frequency or said second operating
6 frequency on the basis of said produced prescribed controlled state.